



MACHAKOS UNIVERSITY

University Examinations for 2018/2019 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF BUSINESS ADMINISTRATION

SECOND YEAR SECOND SEMESTER EXAMINATION FOR

DIPLOMA IN PROCUREMENT AND SUPPLY CHAIN MANAGEMENT

DIPLOMA IN INFORMATION AND COMMUNICATION TECHNOLOGY

DIPLOMA IN ACCOUNTANCY

DPS 107: DACC 113: QUANTITATIVE METHODS

DATE: 8/5/2019

TIME: 11.00-1.00 PM

INSTRUCTIONS: Attempt Question ONE and any other TWO question

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) On the study of costs and revenue for production of biro pens by a small company ACO Ltd, the following expressions were determined. Before production starts a set-up cost of Sh.1500 existed.

$$AR = 600 - 0.5q \quad \text{Average revenue}$$

$$MC = 140 - 8q + 0.15q^2 \quad \text{Marginal cost}$$

Required:

- i) The expression for profit. (3 marks)
- ii) At what quantity q is profit maximize (4 marks)
- iii) the breakeven point (4 marks)
- b) Discuss the relevance of quantitative techniques in management (5 marks)
- c) Solve the following sets of inequalities
 - i) $3x-4 \leq 8+x < 2+7x$
 - ii) $\frac{2x-7}{x-5} \leq 3$ (4 marks)
- d) Briefly explain two types of costs associated with stock (4 marks)
- e) Solve the following system of equations using the matrix approach
 - $2x_1 + 4x_2 + 6x_3 = 18$
 - $4x_1 + 5x_2 + 6x_3 = 24$
 - $3x_1 + x_2 - 2x_3 = 4$(6 marks)

QUESTION TWO (20 MARKS)

- a) Discuss Four methods of collecting primary data stating one advantage and one disadvantage of each (4 marks)

- b) The following data represents the ages of 132 representatives who took part in a survey

Age (yrs)	20-24	25-29	30-34	35-39	40-44	45-49
No.of representatives	2	14	29	45	33	9

Required

- i. The range (2 marks)
 - ii. The mean value of the ages (2 marks)
 - iii. The median value of the ages (4 marks)
 - iv. The mode value of the ages (4 marks)
- c) Differentiate between mutually exclusive events and an independent event. (4 marks)

QUESTION THREE (20 MARKS)

- a) Solve the following
- i) $8y - 3x = 12$
 $5y - 2x = 7$ (3 marks)
 - ii) $3 - x - x^2 = 0$ (3 marks)
- b) Briefly explain FOUR factors that influence the levels of inventory kept by a given firm (4 marks)
- c) A company produces three products P, Q and R from two raw materials A and B and labour L. One unit of product P requires one unit of A, 3 units of B and 2 units of L. One unit of product Q requires 2 units of A and B each, and 3 units of L, while one unit of R needs 2 units of A, 6 units of B and 4 units of L. the company has a daily availability of 8 units of A, 12 units of B and 12 units of L. it is further known that the unit contribution margin for the products is Sh. 3, 2 and 5 respectively for P, Q and R. formulate the problem as a linear programming problem and then solve it to determine the optimum product mix. (10 marks)

QUESTION FOUR (20 MARKS)

- a) Briefly explain the meaning of the term statistics and demonstrate its applications in business (10 marks)
- b) Find $\frac{dy}{dx}$ for
- i. $y = \frac{x}{3 + x^2}$ (3 marks)
 - ii. $y = \frac{x}{3x + 7}$ (3 marks)
 - ii. $y = (x^2 + 16x + 5)^2$ (4 marks)

QUESTION FIVE (20 MARKS)

- a) Discuss the various levels of measurements as used in statistics (5 marks)
- b) Differentiate between the following terms as used in statistics
- i) Quantitative data and Qualitative data (5 marks)
 - ii) Descriptive statistics and Inferential statistics (5 marks)
- c) Explain five reasons why organizations keep inventories (5 marks)